



WHERE
WERE YOU
IN '62?

WEEDS TREES & TURF turns 25 this year. To celebrate the quarter-century mark we take a look back and a look toward the next 25 years in the turf industry. This month, the subject is chemicals.

by Heide Aungst, associate editor

It's 1962...Dacthal and Befasan are used for crabgrass control...Merion Kentucky bluegrass is one of the few refined turf varieties...Toro starts its Irrigation Division.

JFK is president...the Four Seasons are at the top of the music charts...Rachel Carson's *Silent Spring* is published...

Dr. Fred Grau is a consultant to the Hercules Co....Dr. Jim Watson has been with Toro for a decade...Herb Day is in Nebraska doing research and technical service for Stauffer Chemical Co...

Hair is getting longer...pant legs wider...music louder...

And, amidst it all, WEEDS TREES & TURF publishes its first issue.

Well, actually, back then it was WEEDS AND TURF (TREES was added in '64), and it started as a section in *Pest Control* magazine.

"Weeds," as it's known around the office, has gone through many changes during the past 25 years, but the industry has experienced even more. We just try to keep up.

Over the next several months WEEDS TREES & TURF will look at the history of the green industry through

the eyes of three veterans—Grau, Watson and Day. Part I looks at chemicals.

Chemically dependent

Herb Day retired from Stauffer Chemical Co. a year ago, after 30 years of service. He currently works as a consultant in agricultural chemicals.

Chemicals for the turf industry, according to Day, are just entering their fourth generation.

The first generation started before World War II with the use of inorganic chemicals, such as lead arsenate, nicotine sulfate and copper sulfate.

During World War II, the second generation of pesticides started with the development of 2,4-D and DDT.

Using organic chemistry, the chlorinate hydrocarbon chemicals, such as aldrin, dieldrin, heptachlor and chlordane were developed and sold for turf and other crops.

Bandane became popular for crabgrass control in the '50s. Its manufacturer, Velsicol, became No. 1 in the industry.

During this period, other organic pesticides came on the market, including captan, malathion and Sevin.

2,4-D, a broadleaf post-emergence herbicide, was used in mixtures during this time. Primarily it was mixed with mecoprop and silvex. The latter, along with 2,4,5-T, was banned in 1976. (Dioxin forms in the synthesis process.)

In the early '60s, Diamond Shamrock came out with Dacthal (DCPA). Stauffer followed shortly with Betasan.

For post-emergent weed control, Trimec, a combination of 2,4-D, mecoprop and dicamba, hit the market.

"Trimec was marketed as a patented material because of a synergism

claimed which no one could prove or disprove in field studies," says Dr. Wayne Bingham of Virginia Polytechnic Institute. "The patent's just now run out, so there may be similar products coming out."

In the late '60s Balan entered the pre-emergence herbicide market along with organic chemicals Tuper-san, dicamba and a number of turf fungicides.

In 1962, Rachel Carson published the book *The Silent Spring*, which brought the use of pesticides into the public eye. "Everybody in the industry dates things before and after Rachel Carson," says Day.

The book awakened a somber public and led to the EPA's formation. One of the agency's first actions was to ban DDT in 1971.

Geigy, known today as Ciba-Geigy, was the first manufacturer of DDT. Stauffer stopped manufacturing it in 1972.

The ban led the chemical industry to frantically search for a substitute. Companies turned to phosphate products such as malathion, diazinon and Dursban, and carbamates like Sevin. Chlordane was still used, but has since been banned for uses other than

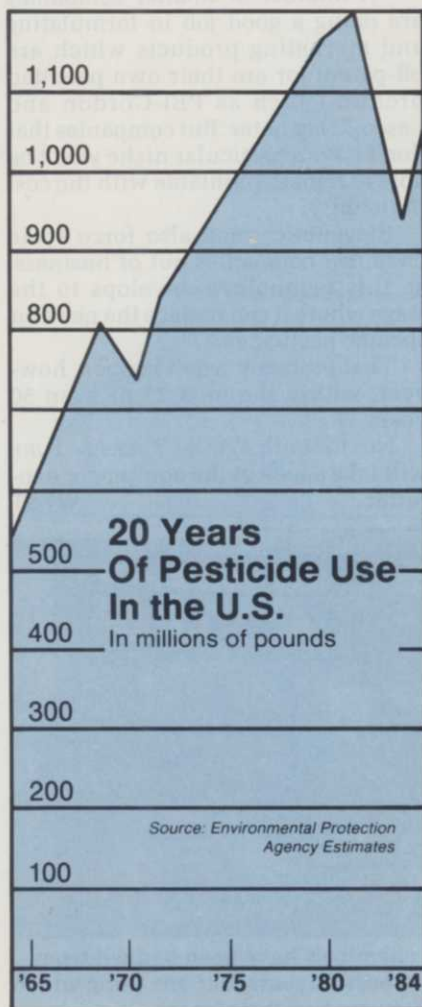
as a termiticide.

Other chemicals also fell by the wayside during this time, including Paris Green, an insecticide, and captan, a fungicide.

The herbicide Ronstar came to the market in the early '70s and, according to Bingham, "was a step forward for golf course people since nothing had worked well on goosegrass on fairways before this," he says. Later Ronstar was cleared for mixture with bensulide to treat golf greens.



Herb Day



Trade shows haven't changed much over the years. In this 1955 photo, AquaGro's first president Larry Fletcher and Jack Boley, director of marketing, sell their product.

Time of transition

A transition among post-emergents occurred in the late '70s. Union Carbide came out with Weedone DPC after the banning of silvex. Dow entered the market with Turflon D, a combination of 2,4-D and triclopyr.

Fertilizers changed dramatically during this time period. The first fertilizers were liquids. Granulars became popular in the late '50s. Early heavy weight fertilizers easily burned turf. Vermiculite became one of the first light-weight granulars.

Sulfur-coated urea became the first slow-release nitrogen source. Nitroform overtook the market as the first soluble fertilizer. "I traveled throughout the country drinking Nitroform Powder Blue cocktails," Grau recalls. "It shocked them at first, but it illustrated the fact that it's safe and breaks down. Of course, I'd have a little whiskey in it sometimes."

Pendimethalin entered the herbicide market in the early '80s (Lesco markets a spray, Scott's a granular fertilizer). "It's a cheaper compound and can be used on a bigger scale," Bingham explains.

The third generation

The third generation began about this time with the use of biorational products, which use bacteria and viruses to fight disease and insects. Growth regulators for plants and insects fit into this category.

Growth regulators, however, are not all ready for the large markets because of costs and regulatory approvals. Some, such as BT (*Bacillus thuringiensis*, trade named Thuricide and Dipel), have been in limited markets for more than 20 years and are just now gaining in market shares.

Another product in this generation is American Hoechst's Acclaim! post-emergence herbicide. (The product should be on the market this year, pending labeling). Acclaim! is not an arsenical product like other post-



Early issues of WEEDS AND TURF concentrated on chemical spraying of turf, ornamentals and trees.

emergence herbicides for annual grasses. It will control annual and perennial grassy weeds in cool-season turf areas at the young stage of the weed's growth. It won't work on old well-tillered grasses.

Dow is experimenting with a product similar to Acclaim!, called Tri-diphane, which is also a post-emergent. The product will be marketed only if it can economically compete with Acclaim!.

No alternatives?

There's also talk of taking old standby products like 2,4-D from the market because they contain phenoxy compounds. "If they take out all phenoxy compounds, it's setting us way back to control weeds," Bingham says. "We don't have anything that will be a good substitute."

One partial alternative, Bingham says, is the Andersons' Break-Thru, a chlorofluorene that works best mixed with dicamba or triclopyr.

Today, biogenetic engineering—changing the actual gene composition of the plant—is where the industry is headed. Day calls this the fourth generation. It is still in its infancy.

Biogenetic research is scarce at the universities, but it's rampant among chemical companies.

"What if Monsanto developed a Kentucky bluegrass that was resistant to Roundup? It could put other chemical companies out of business," says Dr. Bill Torello, who is doing biogenetic research at the University of Massachusetts.

"Biogenetics are a direct result of industry developing new technology in the control of pests and the growing of food, fibre and turf," says Day.

He adds that the costs of developing and maintaining pesticides in the market (including liability insurance) will have a big impact in several years on which companies stay in the business.

Day predicts that some of the current big pesticide producers (like Ciba-Geigy, Monsanto, Dow, Stauffer and Mobay) will stick.

Others will get out when their costs outweigh profits.

"A number of smaller companies are doing a good job in formulating and marketing products which are off-patent (or are their own patented product) such as PBI-Gordon and Lesco," Day notes. But companies that don't have a particular niche won't be able to remain profitable with the cost of liability.

Biogenetics may also force some chemical companies out of business, as this technology develops to the stage where it can replace the need for specific pesticides.

That probably won't happen, however, within the next 25 or even 50 years.

Next month WEEDS TREES & TURF will take a look at the equipment evolution.

WT&T



Spraying remains a primary means for application of chemicals.



A number of unsafe chemicals have been banned from the market during the past 25 years, but one thing which hasn't changed is safety in chemical storage.